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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/507,215	09/16/2004	Inger-Margrethe Procida	P70074US0	5563

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EXAMINER	
WOLLSCHLAGER, JEFFREY MICHAEL	
ART UNIT	PAPER NUMBER
1791	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/507,215	PROCIDA, INGER-MARGRETHE	
	Examiner	Art Unit	
	JEFFREY WOLLSCHLAGER	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 March 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *42-105 and 107-117* is/are pending in the application.

4a) Of the above claim(s) *51,52,54,95-99,108,109 and 112-116* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *42-50,53,55-94,100-105,107,110, 111 and 117* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 23, 2009 has been entered.

Response to Amendment

Applicant's amendment to the claims filed March 23, 2009 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 42-48, 53, 55-93, 100-105 an 117 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sjoberg et al. (US 6,106,761) in view of Hardy et al. (US 5,918,641) and either of Hirokazu et al. (US 3,513,228) or Kent (US 2,528,523).

Regarding claims 42, 46, 53, Sjoberg et al. teach the basic claimed process of producing a pipe/tube comprising extruding a mixture of polyethylene and a peroxide for crosslinking the polymer mixture (col. 4, lines 8-67) in a contact-less manner with infrared radiation (col. 1, lines 6-15; Figure 1). The process of Sjoberg et al. allows for extrusion of pipes/tubes without deformation or local thickening due to the short crosslinking zone (col. 3, lines 9-42; col. 5, line

60-col. 6, line 62). While Sjoberg et al. imply no cross-linking takes place in the extruder (i.e. extruded at a temperature below the activation/decomposition temperature of the peroxide), they do not expressly state it. However, each of Hirokazu et al. (col. 3, lines 18-50; col. 4, lines 54-61) and Kent (col. 1, lines 44-col. 2, lines 38) teach that it is known and desirable in the art of crosslinking extruded materials to ensure the crosslinking does not happen in the extruder. Additionally, Sjoberg et al. do not teach the pipe/tube is employed in a flexible offshore pipe. However, Hardy et al. teach that it is known to employ crosslinked polyethylene as a layer in a flexible offshore pipe.

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have modified the teaching of Sjoberg et al. and to have ensured that no cross-linking takes place in the extruder (i.e. extruded at a temperature below the activation/decomposition temperature of the peroxide) as suggested by either of Hirokazu et al. or Kent, for the purpose, of producing a tube/pipe with a smooth surface and that flows smoothly through the cross-head/die (Hirokazu et al.: col. 3, lines 18-50; col. 4, lines 54-61 and Kent (col. 1, lines 44-col. 2, lines 38).

Additionally, it would have been obvious to one having ordinary skill at the time of the claimed invention to have employed the method of Sjoberg et al. for producing a crosslinked polyethlyene tube/pipe and to have utilized it as a layer in a flexible offshore pipe as suggested by Hardy et al. for the purpose of producing a flexible pipe having a suitable structure (e.g. a crosslinked PE layer for a flexible offshore pipe) in a simple and efficient manner (e.g. Sjoberg et al.'s method of using infrared radiation that allows for a small crosslinking zone which minimizes deformation or local thickening of the tube/pipe, col. 3, lines 36-42).

As to claims 43 and 69, Kent discloses extruding at a temperature of 110 °C – 180 °C and an activation temperature of 180 °C - 250 °C (col. 2, lines 13-20).

As to claim 44, Sjoberg et al. disclose extruding onto a core/supporting unit (col. 7, lines 50-62; col. 6, lines 25-36).

As to claim 45, Sjoberg et al. disclose that an outer support is not needed by the process. Accordingly, this implies that one may be employed if desired for additional support. (col. 6, lines 25-36). Further, the examiner notes that the instant disclosure (US 2005/0221033) acknowledges that such a calibrator is known in the art of extruding liners (paragraph [0057]).

As to claims 47, 48, 90, 91 and 117, Sjoberg et al. immediately move the extruded polymer to the infrared zone (Figure 1). It follows that minimum cooling of the tube occurs and minimum time has elapsed.

As to claims 55-58, Hardy et al. disclose the suitable densities for a crosslinked polyethylene offshore lining (col. 4, lines 28-33; col. 13, lines 38-44).

As to claims 59 and 60, Sjoberg et al. disclose the polymer is polyethylene (col. 4, lines 8-12) and employ about 0.5% peroxide in one embodiment (col. 6, lines 36-62).

As to claims 61-64, Sjoberg et al. do not expressly discuss employment of other additives or fillers. However, the claims recite "up to about" a weight percentage. This includes 0% of these materials. Further, one having ordinary skill would have readily determined what type and amount of fillers, additives or copolymers to employ in the process to achieve desired properties as is routinely practiced and well-known in the pipe/tube extrusion art.

As to claims 65-68 and 70, Sjoberg et al. disclose 0.5% ditert-butyl peroxide (col. 6, lines 56).

As to claims 71-77, Sjoberg et al. disclose employment of infrared radiation at a wavelength of 1.2 um. Additionally, they suggest avoiding the wavelengths of 3.2 – 3.6 um and 6.7 - 6.9 um, but suggest that the other wavelengths within the range of 2 - 10 um may be employed (col. 5, lines 60- col. 6, line– 24).

As to claims 78-81, Sjoberg et al. suggest minimizing the absorption of energy into the polymer by avoiding the wavelengths of 3.2 - 3.6 um and 6.7 - 6.9 um. However, as shown in Figure 4, there are smaller absorption peaks at other wavelengths within the claimed ranges of 0.5 - 10 um, 1 - 7 um, and 3 - 7 um that are not excluded from the teaching of Sjoberg et al.

As to claims 82 and 83, Sjoberg et al. teach that a certain overpressure in the tube is employed as is routinely practiced in the art (col. 4, lines 27-33). As to the precise pressure, one having ordinary skill would have readily determined the required pressure to ensure minimal bubble formation. Additionally, Hirokazu employ an overpressure of nitrogen to prevent foaming (col. 1, lines 62- col. 2, lines 6).

As to claims 84 and 85, Sjoberg et al. disclose the time in the crosslinking zone is short (col. 3, lines 36-44). Additionally, Hirokazu et al. disclose crosslinking times of two minutes (col. 2, lines 36-50).

As to claims 86 and 87, Kent discloses heating to a temperature of 180 °C - 250 °C (col. 2, lines 13-20) and Hirokazu et al. disclose a temperature of 200 °C – 300 °C (col. 1, lines 48-61).

As to claims 88 and 89, Sjoberg et al. disclose a desirable range of 70-90% crosslinking and exemplify 76 and 78% (col. 6, lines 55-61).

As to claim 92, the material is cooled to ambient temperature after the process (Figure 1).

As to claim 93, Sjoberg et al. disclose extruding onto a metallic core (col. 7, lines 39-62).

As to claim 100, Sjoberg et al. do not substantially change the velocity of their material during the processing (Figure 1).

As to claim 101-105, Hardy et al. exemplify a wall thickness of 10 mm (Example 2) and further suggest thicknesses greater than 12 mm (col. 8, lines 40-65). Additionally, based upon

the simple and efficient method of Sjoberg et al. compared to the prior art method discussed by Hardy et al. one having ordinary skill would have readily determined and optimized the size of the thickness of the tube to a desired final thickness. One having ordinary skill would have had a reasonable expectation of success of producing a wall of such as thickness by the method of Sjoberg et al.

Claims 49, 50, 94, 107, 110 and 111 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sjoberg et al. (US 6,106,761) in view of Hardy et al. (US 5,918,641) and either of Hirokazu et al. (US 3,513,228) or Kent (US 2,528,523), as applied to claims 42-48, 53, 55-93, and 100-105 above, and further in view of Procida et al. (WO 99/67560).

Note: Citations to Procida et al. are from the US equivalent document US 2001/0021426.

As to claims 49, 50, 94, 107, 110 and 111, the combination teaches the method set forth above. While Sjoberg et al. do teach coextruding a plurality of layers to the inside or outside of the polyethylene tube layer, as needed, with another polymer, Sjoberg et al. do not teach extruding directly onto a reinforcement layer of the offshore pipe. However, Procida et al. teach a method of extruding directly onto the carcass of an offshore pipe (Example 1). Additionally, Procida et al. teach employment of a gas permeation barrier layer to improve the barrier properties of the pipe.

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have extruded the layer of Sjoberg et al. onto a reinforcing layer/carcass as set forth by Procida et al. for the purpose of expediting the manufacturing process as is routinely practiced in the art. Further, it would have been obvious to one having ordinary skill at the time of the claimed invention to have employed a barrier layer in the offshore

pipe as suggested by Procida et al. for the purpose of improving the barrier properties of the pipe as is routinely practiced in the art.

Claims 78-81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sjoberg et al. (US 6,106,761) in view of Hardy et al. (US 5,918,641) and either of Hirokazu et al. (US 3,513,228) or Kent (US 2,528,523), as applied to claims 42-48, 53, 55-93, and 100-106 above, and further in view of Heino (WO 01/00381). *Note: This is an alternative rejection to the rejection of claims 78-81 above.*

Note: all citations to Heino are from the US equivalent document: US 6,797,741.

As to claims 78-81, the combination teaches the method set forth above. Additionally, Heino discloses a method of crosslinking polyethylene with infrared radiation wherein the suitable wavelength is given to be 5.0 micrometers to 1.2 micrometers (col. 4, lines 7-61) and further notes that the wavelength to be employed is readily optimized (col. 3, lines 55-60).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have optimized the wavelength of infrared radiation employed to crosslink the polyethylene of Sjoberg as suggested by Heino within values of the ranges set forth in claims 79-81.

Response to Arguments

Applicant's arguments filed March 23, 2009 have been fully considered but they are not persuasive. Applicant argues that Sjoberg discloses a method of producing pipes with a thickness of 2.5 mm and that Sjoberg are stand alone pipes having no additional polymer layers. This argument is not persuasive. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually

where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The examiner notes that claim 42 does not positively require more than one layer. Further, the examiner notes that the combination with Hardy suggests a plurality of layers. As to the arguments regarding the thickness of the pipe, the examiner notes that Sjoberg's method clearly takes into account issues of deformation discussed in the arguments and provides reasons as to why their method is an improvement over convetional methods and is applicable to a broad range of dimensions (e.g. contactless, uniform heating, rapid, and avoids deformation) (see: col. 3, lines 9-39; col. 5, lines 1-5 and 56-63; col. 6, lines 8-10). Further, Sjoberg teaches the method can employ a core for larger diameter (and implicitly larger thickness) pipes (col. 7, lines 50-54) and that the specific example of 2.5 mm thickness is not a limiting example (col. 6, lines 62-66). Therefore, the teaching of Sjoberg clearly teaches a method that has knowingly solved the problems argued by applicant from the Hardy reference. Thus, while Hardy may not have known the claimed extrusion method (hence the combination rejection), Sjoberg provides a strong teaching and expressly resolves the argued problems. When taken as a whole, the examiner maintains the combination renders the claims *prima facie* obvious.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEFFREY WOLLSCHLAGER whose telephone number is (571)272-8937. The examiner can normally be reached on Monday - Thursday 6:45 - 4:15, alternating Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jeff Wollschlager/
Examiner, Art Unit 1791

May 19, 2009